

WE CLAIM:

1. A component based detection system (CBDS) which operates to detect presence of at least one person in an image of a region of interest in an environment, the component based detection system (CBDS) comprising:

(a) a set of training images; and

(b) a plurality of training subsets selected from said set, wherein at least a portion of said training subsets includes positive training images which comprise at least one image portion of at least one person, wherein each of said positive training images include a characteristic trait different from the characteristic traits of the other training subsets;

wherein each said training subset is used to respectively train a plurality of component classifiers to recognize at least a portion of said image of the at least one person in each of a plurality of sub-regions of the region of interest.

2. The component based detection system (CBDS) of claim 1, wherein at least a portion of said training subsets includes negative training images which do not comprise any image portion of at least one person, wherein each of said negative training images include a characteristic trait different from the characteristic traits of the other training subsets.

3. The component based detection system (CBDS) of claim 1, further comprising:

(c) a holistic classifier which is trained to combine respective assessments from said component classifiers and provide a global assessment whether the at least one person is present in the region of interest.

4. A component based detection method which detects presence of at least one person in an image of a region of interest in an environment, the component based detection method comprising the steps of:

(a) providing a set of training images of the environment;

(b) selecting from said set a plurality of training subsets, wherein at least a portion of said training subsets includes positive training images which comprise at least one image portion of at least one person, wherein each of said positive training images include a characteristic trait different from the characteristic traits of the other training subsets;

(c) using each said training subset respectively training a plurality of component classifiers to recognize at least a portion of said image of the at least one person in each of a plurality of sub-regions of the region of interest.

5. The method, according to claim 4, wherein at least a portion of said training subsets includes negative training images which do not comprise any image portion of at least one person, wherein each of said negative training images include a characteristic trait different from the characteristic traits of the other training subsets.

6. The method, according to claim 4, further comprising the step of:

(d) second training a holistic classifier by combining respective assessments from said component classifiers for providing a global assessment whether the at least one person is present in the region of interest.

7. The method, according to claim 6, further comprising the step of:

(e) third training said holistic classifier on substantially all said training images of said set.

8. The method, according to claim 7, wherein said (e) third training is performed using an Adaboost algorithm.

9. The method, according to claim 4, wherein the number of training images in each said training subset is less than three per cent of the number of training images in said set.

10. The method, according to claim 4, wherein the number of training images in each said training subset is less than five per cent of the number of training images in said set.

11. The method, according to claim 4, wherein the number of training images in each said training subset is less than ten per cent of the number of training images in said set.

12. An automotive collision warning and avoidance system which performs the component based detection method of claim 4.